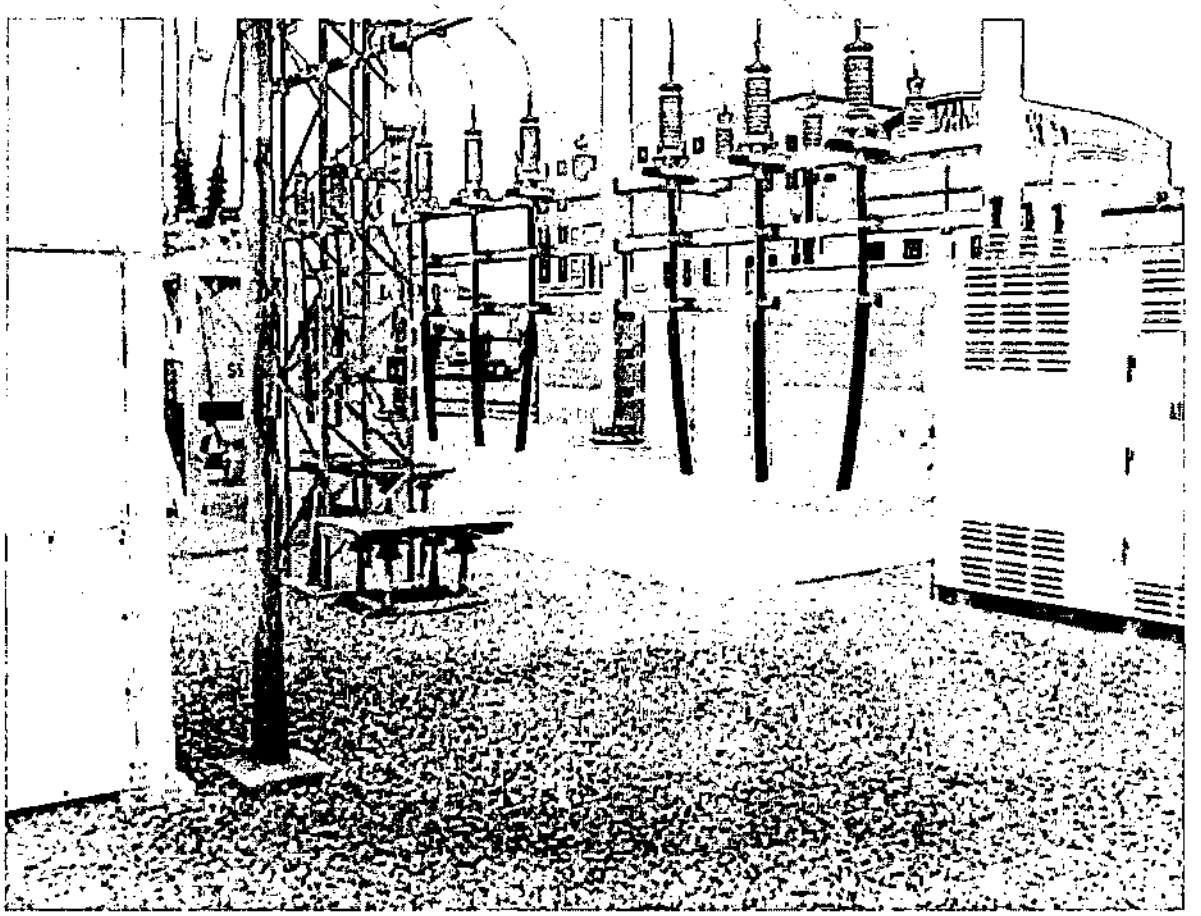
PacifiCorp Property

Libby Amphibole Asbestos Cleanup

Work Plan



Utah Power 3rd West Substation
147 South 400 West
Salt Lake City, Utah

Acronyms

AHERA	Asbestos Hazard Emergency Response Act of 1986
AOC	Administrative Order on Consent
BZ	Breathing Zone
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CSHASP	Comprehensive Site Health and Safety Program
CFR	Code of Federal Regulations
CRZ	Contamination Reduction Zone
EPA	U.S. Environmental Protection Agency
EL	Excursion Limit
EZ	Exclusion Zone
HEPA	High Efficiency Particulate Air
HSM	Health and Safety Manager
LA	Libby Amphibole
LOTO	Lock Out Tag Out
NCP	National Contingency Plan
NIOSH	National Institute of Occupational Safety and Health
NPE	Negative Pressure Enclosure
OSHA	Occupational Safety and Health Administration
PERCo	PacifiCorp Environmental Remediation Company
POTW	Publicly Owned Treatment Works (sanitary sewer system)
PPE	Personal Protective Equipment
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
R&R	R&R Environmental, Inc.
RASAP	Response Action Sampling and Analysis Plan
STEL	Short-Term Exposure Limit
TEM	Transmission Electron Microscopy
TWA	Time Weighted Average
WP	Work Plan

Section 1

Introduction

The U.S. Environmental Protection Agency (EPA), Region VIII is conducting emergency removal actions under the National Contingency Plan (NCP), utilizing CERCLA regulations, in Libby, Montana to address the risk to human health caused by exposure to Libby amphibole (LA) asbestos fibers. The LA fibers were introduced into the environment via vermiculite mined from and used, spilled, and disposed of throughout the Libby area.

Much of this mined vermiculite was sent to plants throughout the United States for processing. One of these processing plants was located in Salt Lake City, Utah, at the approximate center of the block bounded by 100 and 200 South and 300 and 400 West. Concentrations of LA were found in soils and in dust in buildings within this block. The U.S. EPA is conducting NCP emergency removal actions at various locations on the block.

The plot where the vermiculite processing plant once stood is now owned by PacifiCorp and is inside the fence of an electric utility distribution substation. However, there is no substation electrical equipment installed within the footprint of the processing plant. The address of this PacifiCorp substation is 147 South 400 West and is known to PacifiCorp as the 3rd West Substation. It is hereinafter referred to as the PacifiCorp Property. PacifiCorp and EPA have agreed, through an Administrative Order on Consent (AOC), that the PacifiCorp Property is to be cleaned up under the same general procedures and guidelines and in a similar manner as properties in Libby, Montana, e.g. as a NCP emergency removal action under CERCLA regulations. The cleaning of the PacifiCorp Property is part of EPA's overall Salt Lake City NCP emergency removal action strategy, but is being handled somewhat separately. On this property, PacifiCorp is assuming responsibility for and performing the cleanup. This response action Work Plan (WP) outlines the approach to conducting this cleanup.

1.1 Administrative Order on Consent

Through an AOC, PacifiCorp is cleaning up property it owns in Salt Lake City, Utah (the PacifiCorp Property), that was contaminated with LA asbestos when a previous owner processed vermiculite from Libby, Montana at the site. PacifiCorp will utilize a number of contractors to perform various elements of the cleanup, including, but not limited to engineering; dust removal and building interior cleanup; soil removal, transport and disposal; air monitoring; and preparation of reports.

1.2 Document Purpose

The purpose of this WP is to describe the technical requirements of the PacifiCorp LA Project, define roles and responsibilities of all project resources, and to serve as a guidance document for the PacifiCorp LA Project as it proceeds. Appendices to this work plan have been prepared for each portion of the property requiring cleanup activities, detailing contamination extent, cleanup activities, and restoration plans.

This WP complements other documents prepared for the PacifiCorp LA Project, such as the AOC, CSHASP, and the Site History.

Any site-specific WP Appendices or applicable drawings will be reviewed and agreed upon by PacifiCorp, EPA, R&R, and the cleanup contractor before cleanup activities commence. As necessary, this WP will be modified to reflect EPA requirements and changes in the scope of the project. This WP includes the *Response Action Sampling and Analysis Plan* (RASAP) as Appendix A.

1.3 Background

An extensive site history, explaining the history of ownership and use, has been prepared by PacifiCorp Environmental Remediation Company (PERCo). This history, entitled *3rd West Substation Site History Report,* is dated March 26, 2004. Numerous other documents exist that address the site. Also, at the request of EPA, the U.S. Department of Transportation Volpe Center and CDM Federal Programs Corporation prepared a report of sampling activities conducted at the PacifiCorp Property and at adjoining parcels. This report is entitled *Sampling and Analysis Plan Revision 3* and dated March 2004. These reports give the background and characterization of the site. Cleanup of some adjoining parcels is currently underway.

Section 2

Roles and Responsibilities

The PacifiCorp LA Project response action team consists of PacifiCorp (site owner), EPA (the lead Federal agency for the site), PERCo (project consultant), R&R (project consultant), Thermal West Industrial, Inc. (cleanup contractor), and ~~other contractors~~Champion Industrial (cleanup contractor). The roles and responsibilities of these team members follow.

2.1 PacifiCorp

As owner of the property, PacifiCorp is responsible for coordinating and paying for all cleanup activities on the PacifiCorp Property. As such, PacifiCorp hires and oversees all contractors and consultants, prepares or oversees preparation of all plans and reports, and directs all work covered by this WP. PacifiCorp also participates with EPA, Utah Department of Environmental Quality (DEQ), and others in a Community Involvement Strategy to provide necessary information to the public. PacifiCorp will work with EPA and UDEQ to coordinate communications efforts and strategies.

2.2 EPA

EPA is the lead Federal agency for implementing CERCLA Removals and providing Federal oversight of cleanup actions implemented by private parties at sites under CERCLA purview, including the PacifiCorp LA Project. It has overall responsibility for monitoring the response action activities. It has put in place an AOC with PacifiCorp for response activities at the site. EPA responsibilities include, but are not limited to:

- Provide overall agency oversight for the response action activities.
- Maintain the AOC with PacifiCorp.
- Assist in obtaining access agreements for all activities that must cross or otherwise utilize property owned by others than PacifiCorp.
- Approve plans prepared for implementing the work.
- Coordinate with the community and local, state, and federal agencies as needed.
- Collect and analyze final clearance air samples from inside the project work area for interior cleanings.
- On-going qualitative and quantitative evaluation of abatement/cleanup efforts, including appropriate personal and perimeter air monitoring.
- Clearance sampling for various portions of the site.
- Perform and analyze clearance samples of indoor air and efficacy samples of various soil horizons. A percentage of side-by-side air samples may be taken so as to verify the accuracy of the PacifiCorp laboratory.

2.3 Environmental Consultants / PERCo and R&R Environmental, Inc.

PacifiCorp Environmental Remediation Company (PERCo) has been retained by PacifiCorp to investigate the history of the PacifiCorp Property and surrounding properties. PERCo is responsible for determining both the chain of ownership and the myriad uses of these properties. PERCo, having extensive experience dealing with the intricacies of CERCLA cleanup projects, will also provide PacifiCorp guidance as the project progresses.

R&R Environmental, Inc. (R&R) is an industrial hygiene consulting firm, with extensive experience in the health and safety aspects of asbestos work and in overseeing asbestos abatement jobs. PacifiCorp has retained R&R to prepare the Comprehensive Site Health and Safety Plan (CSHASP) and the RASAP. R&R will also act as PacifiCorp's on-site Health and Safety Manager and Project Supervisor. Some of R&R's specific duties are listed below.

- Assist PacifiCorp in planning the cleanup activities.
- Assist in the preparation of the CSHASP.
- Review WP addenda and design documents provided by contractors.
- Assist in pre-removal meetings with the cleanup contractor to discuss cleanup activities.
- Track project progress.
- Monitor site security.
- Record digital photos of property before, during, and after cleanup activities.
- Monitor the cleanup contractors to ensure compliance with approved plans, drawings, and specifications.
- Provide technical oversight support throughout the duration of the cleanup and restoration activity.
- Provide health and safety coordinator(s) for all contractors working at the site.
- Inspect containments and personal decontamination stations for proper setup and operation.
- Collect confirmatory soil samples.
- Procure laboratory services for analysis of removal confirmation samples and other removal-related samples (e.g., soil) as requested.
- Provide sample coordinator to generate chain-of-custody forms and coordinate analysis of samples.
- Provide copies of all paperwork, (e.g., field sample data sheets, logbooks, removal checklists, etc.) to PacifiCorp, including any revised forms.
- Maintain file folders that include sample data and copies of all applicable logbook pages, digital photographs, and EPA correspondence.
- Collect perimeter air samples throughout duration of soil removal activities.
- Collect personal air samples (8-hour time weighted average [TWA] and excursion limit [EL] in accordance with Occupational Safety and Health Administration [OSHA] 29 Code of Federal Regulations [CFR] 1926.1101) as required based on historical personal air sampling data.
- Conduct final inspections to determine completeness of the response action.
- Record minutes of meetings.
- Prepare Monthly reports.
- Work cooperatively with EPA to arrange appropriate personal and work-site monitoring needs.

2.4 Cleanup Contractors

Contaminated soil and interior cleaning (i.e., dust removal) will be performed based upon task orders and all approved plans. In summary, the following activities will be performed by the cleanup contractors:

- Attend pre-cleanup activity site walks at the properties.
- Maintain site-specific health and safety plans.
- Identify and acquire necessary permits.
- ~~Set up and maintain field office/staging area.~~

- Excavate asbestos contaminated soils to the depth and extent indicated in the work plan addenda or design documents.
- Transport excavated soils to approved offsite disposal locations.
- Restore property to its pre-existing condition. Final grade will be restored to provide proper drainage.
- Conduct health and safety monitoring.
- Implement and monitor engineering controls for dust control.
- Coordinate with R&R for confirmatory soil sampling and subsequent laboratory analyses.

2.5 Other Contractors

Other contractors will be procured as directed by PacifiCorp to provide fill material, fencing, laboratory analysis, security, and other materials and services. Their responsibilities include:

- Provide materials or services in accordance with the contract documents and as directed by PacifiCorp.

Section 3

Procurement of Contractors

A variety of contractors will be utilized to complete the response actions for the PacifiCorp Property site, including cleanup contractors and contractors for providing fill, restoration, laboratory analysis, and fencing. The following sections describe the procurement process, the types of contracts, and which entity will procure and manage these contractors.

3.1 Cleanup Contractors

The cleanup contractors will submit cost estimates, as requested by PacifiCorp, based on the work plan addenda provided. PacifiCorp, or its agent R&R Environmental, will manage the construction contractor in the field. PacifiCorp and R&R will continually evaluate and oversee cleanup contractors and make changes as necessary and feasible.

3.2 Other Contractors

In addition to the cleanup contractors, a variety of other contractors will be used to complete the work. These include contractors to provide sample analysis, fill, restoration, and other activities related to the response activities. These contracts will be procured and managed by PacifiCorp or R&R based on PacifiCorp's direction.

3.3 Work Plan Specifications

PacifiCorp has prepared WP specifications for each separate portion of the property. (Included as Appendices B and C) The WP specifications provide the specific details of the cleanup to be conducted at the property. Descriptions of the locations of contaminated soils and dust are included in these specifications, along with direction to the cleanup contractor(s) on specifics of the response activities to be conducted.

The WP Appendices will be provided to the cleanup contractor(s) in advance of starting the cleanup. There will also be a pre-cleanup walkthrough conducted for each portion of the property to allow the cleanup contractor(s) to ask questions and fine-tune its plan to implement the WP.

Section 4

Contaminated Dust Removal (Interior Cleaning of Control House)

LA asbestos in concentrations above EPA's action level has been found in dust in the Control House on the PacifiCorp Property. The Control House has two levels that do not interconnect. Each floor of the Control House will be treated individually. When the cleaning is performed, the following procedures will be implemented.

4.1 Cleaning Procedures

The cleanup contractor will remove the dust from the interior of the structure by using a HEPA vacuum and wet wiping all surfaces as necessary. An appropriate negative pressure enclosure will be designed and constructed pursuant to OSHA 1926.1101, with HEPA-equipped negative-pressure air filtration devices that will achieve a minimum of four air changes per hour in the containment. Workers will work in such a manner that, to the extent possible, the flow of air draws contamination away from the worker's breathing zone. The cleanup contractor technicians will enter the space in Level C PPE and HEPA vacuum the horizontal and vertical surfaces in conjunction with wet-wiping techniques. Specifics on the Control House cleaning are found in Appendix B.

4.2 Air Sampling During Contaminated Dust Removal (Interior Cleaning)

4.2.1 Personal BZ Air Sampling

Personal BZ air samples will be collected on personnel conducting contaminated dust removal to document that the level of respiratory protection is adequate for the task being conducted. Personal BZ air sample collection procedure will be conducted in accordance with the RASAP (Appendix A). Samples will be evaluated pursuant to TEM/AHERA counting methods.

4.2.2 Final Clearance Air Sampling

Final clearance air sampling is addressed in detail in the RASAP (Appendix A). As a brief overview, samples will be collected on each floor cleaned by the cleanup contractor. If the removal area requires encapsulation, final clearance air samples will be collected after the encapsulant has been applied and allowed to dry for up to 24 hours. When ready for final clearance air samples, a 1-hp, minimum, leaf blower will be used to blow down the space. One 20-inch fan per 10,000 ft^3 of area, as space allows, will then be placed in the center of the floor and pointed upwards during the sample period.

Five final clearance air samples will then be collected per floor. Each floor sampled will be considered clean if all five final clearance air samples are considered non-detect for LA. Final clearance air sample calibration and collection procedures will be conducted in accordance with EPA SOP 2015; Asbestos Sampling 11/17/94 Rev. 0.0. Requirements for collection and analysis of final clearance air samples are outlined in 40 CFR 763 Subpart E , Appendix A -*Interim Transmission Electron Microscopy Analytical Methods -- Mandatory and Non-Mandatory -- and Mandatory Section to Determine Completion of Response Actions*, with modifications. Once this

criterion has been met, engineering controls are removed, and the structure will be ready for unrestricted access.

Section 5

Contaminated Soil Removal

Contaminated soil removals will be conducted as directed by PacifiCorp and as specified in Appendix C. In general, surface soils will be removed if analytical results of soil samples collected from a yard area detect any LA. {Details regarding action levels and clearance criteria rationale for soil are found in the EPA Action Level and Clearance Criteria Technical Memorandum, Libby Asbestos Site (EPA 2003a) and in this document's Appendix A, Response Action Sampling and Analysis Plan.}

5.1 Pre-Cleanup Meeting

In preparation for the commencement of cleanup actions, a pre-cleanup meeting will be held. This meeting will be for the purpose of ensuring each of the entities understands its roles and responsibilities, as well as those of the other entities, and how they interact. Contractors and Consultants will explain their roles in the cleanup, how their parts will progress, and any safety hazards associated with their parts of the work. Minutes of the pre-cleanup meeting will be recorded by R&R.

5.2 Site Preparation

PacifiCorp, R&R, and the cleanup contractor will evaluate any work plan addenda before starting the cleanup work. Any imminent hazards identified during the Pre-Cleanup Meeting will be evaluated to determine if corrective actions are necessary. Residential traffic and pedestrian points of hazard will be identified and posted with legible traffic signs throughout the duration of removal activities. Work area boundaries will be established, demarcated, and posted with appropriate signage. Waste load out and equipment staging areas, personnel and equipment pathways will be defined and demarcated as necessary. The cleanup contractor will be responsible for maintaining these boundaries throughout the duration of removal activities. Based on the excavation area, the following additional activities will be completed by the cleanup contractor.

5.2.1 Protection of Existing Features

While contaminated soil excavation is occurring, structures, buildings, and improvements (i.e. electrical equipment, fences, sidewalks, driveways, and other selected items) will be protected by the cleanup contractor. These items will be noted during pre-cleanup site walks.

The PacifiCorp Property is a working, energized electric utility substation, important for providing electric power to downtown Salt Lake City. The high voltage electrical equipment in this substation cannot be turned off and the electric power cannot be rerouted during cleanup activities. The cleanup must occur with the substation energized. Many electrical conductors and other pieces of equipment are installed underground in the substation. In some locations, excavation may not be possible without contacting these conductors or equipment. Due to the extreme danger presented by contact with high voltage electrical conductors or equipment, alternatives to excavation will be considered in these areas. Specifics on these alternatives are included in Appendix C or will be added as addenda to Appendix C.

5.2.2 Exclusion Zone Setup

Exclusion zones (EZs) will be set up inside of the designated work area to ensure the health and safety of the workers and public. EZ boundaries are defined based on previous sampling results and site investigations and are mapped in Appendix C. The EZs will encompass the excavation area and will also include selected non-contaminated areas adjacent to the excavation areas. These non-contaminated areas may be utilized as contamination reduction zones (CRZ) for personnel exiting the EZs and entering the decontamination unit, or for staging of waste bags or equipment. The pathway on the ground inside the CRZ will be lined with polyethylene sheeting to ensure contamination is not spread onto a non-contaminated area. In some circumstances, the EZ may be moved (i.e., sliding EZ) during a cleanup activity to facilitate the cleanup. No adjustment to the EZ will occur without the approval of the PacifiCorp onsite representative. Asbestos warning signs will be posted on the EZ boundaries so that personnel may read the signs and take necessary protective steps before entering an EZ. All activities performed within the EZs will be performed in Level C personal protective equipment (PPE), as directed in the CSHASP, unless specific modified procedures are cleared by the site Health and Safety ~~Officer~~Manager (HSM).

5.2.3 Decontamination Setup

In accordance with the CSHASP, personnel decontamination will be evaluated on an area-specific basis, set-up and approved before contaminated soil removal commences. A properly demarcated three-stage decontamination unit will be established consisting of an equipment room, shower area, and a clean room for personnel decontamination during contaminated soil removal. Personnel decontamination procedures will be posted in the clean room so that personnel may read and take necessary steps to ensure their safety. Modified decontamination procedures, consisting of the use of designated facilities such as boot wash and/or wash down stations, may be instituted if the area to be cleaned is, through agreement between EPA and PacifiCorp, considered small enough to warrant such. Potable water will be used for all personnel decontamination. Wastewater generated from personnel decontamination will be collected and either sprayed on contaminated soils for dust suppression or passed though a 2-micron filter and discharged to the city POTW.

Equipment pathway controls will be implemented. That is, the paths the equipment will traverse during the work will be controlled. These controls are designed to minimize contamination of equipment during soil load-out. These controls may consist of, but are not limited to, haul trucks driving over excavated pathways and covering truck dump boxes with 6-mil polyethylene sheeting to prevent contamination during contaminated soil loading. All haul truck exteriors will be fully decontaminated once contaminated material has been disposed of. Specific requirements regarding the decontamination process for both personnel and equipment should be presented in the cleanup contractor's health and safety plan and shall be in full compliance with the CSHASP for the PacifiCorp Property.

5.3 Soil Excavation

5.3.1 Contaminated Soil Removal

The cleanup/construction contractor will be responsible for selecting the appropriate equipment for conducting the excavation based on the planned removal. Soil will be excavated to depths specified by the PacifiCorp Project Manager.

Areas to be excavated are indicated on the plot map in Appendix C. Criteria for clearance are included in the RASAP (Appendix A).

Following the excavation of the contaminated soils within the demarcated area, the PacifiCorp Project Manager or his designee will inspect the excavation. If there ~~is~~are visible seams or pockets of high concentration vermiculite in the excavation, the cleanup contractor ~~will~~may be directed to remove additional contaminated soil until, in the judgment of the PacifiCorp Project Manager, the remaining soils are expected to meet soil clearance criteria (~~no LA detected by NIOSH 9002 protocols~~See Appendix A, Response Action Sampling and Analysis Plan for soil clearance criteria). At this depth, the site PacifiCorp Project Manager will direct the cleanup contractor to stop excavating, the EPA's on-site representative will collect confirmation soil samples in accordance with the RASAP (Appendix A). If the sample results indicate that the remaining soils comply with the clearance criteria, the excavation will be considered complete. If the sample results indicate that contaminated soils still exist within the excavation, the cleanup contractor ~~will~~may be directed to excavate the additional contaminated soils. Alternatively, the PacifiCorp Project Manager may decide to stop the excavation, install a warning barrier, and implement institutional controls. Following the excavation of ~~the~~any additional contaminated soils, confirmation samples will be collected and the sample results evaluated to determine whether any additional ~~excavation is necessary~~material will be excavated. This iterative process will continue until the sample results indicate that no soils contaminated beyond clearance criteria remain within the ~~excavation~~excavated area, or the PacifiCorp Project Manager decides to implement institutional controls.

5.3.2 Confirmation Soil Sampling

Confirmation sampling may be performed simultaneously with the excavation of contaminated soils. That is, if the excavation is large enough, confirmation samples may be collected in areas of the excavation~~ng~~ that are completed, while the cleanup contractor completes excavation in other areas. If confirmation sampling is performed simultaneously with the excavating activity, and areas of the excavation are deemed complete, the cleanup contractor will take extra caution to prevent cross contamination. Confirmation sampling will be conducted in accordance with the RASAP (Appendix A).

5.3.3 Transportation and Disposal

Contaminated material will be excavated and ~~live~~-loaded into trucks directly at the property, with care taken to prevent contamination of the trucks. Poly sheeting may be placed over the side of the truck bed to prevent any contaminated material from spilling on the truck during loading. Controlled pathways will be constructed over uncontaminated property areas whenever possible so that trucks can be driven to the ~~area(s) requiring excavation with minimal disruption~~loading area without becoming contaminated. Prior to departing the property, trucks will have tarps secured over the beds. The utmost care will be given during loading to ensure that the truck exterior remains clean; however, trucks will be cleaned with water should the decontamination be warranted. Only authorized personnel will operate the mobile equipment. The cleanup contractor will ensure that all operators are fully trained to operate the equipment. All cleanup contractor personnel will be at least 2-hour asbestos awareness trained. All cleanup contractor personnel will have current 40-hour initial HAZWOPER training and annual 8-hour refreshers. Contaminated soils will be disposed of at Clean Harbors' Grassy Mountain Landfill or another appropriate facility.

5.4 Soil Encapsulation

In areas of the PacifiCorp Property, especially areas where high voltage electrical equipment is located, contaminated soil may be left in place and encapsulated. ~~Should this occur, an addendum to this Work Plan will be written describing the method(s) of~~

~~encapsulation.~~Encapsulation in areas where no electrical equipment is located will be accomplished by applying a warning layer of brightly colored plastic, or equivalent, then covering with clean backfill material. The plastic will serve as a warning for any future excavation. Encapsulation will be accompanied by institutional controls, consisting of elements such as deed restrictions and engineering and maintenance procedures warning of potential LA contamination below the warning layer. They will also indicate actions that must be taken to safely dig or drill below the warning layer.

In areas where electrical equipment is located, materials other than plastic, materials more compatible with electrical substation operations, may be used to construct a warning layer. Otherwise, the encapsulation process will be as described above.

5.5 Air Sampling During Contaminated Soil Removal

5.5.1 Stationary Air Sampling

During contaminated soil removal, the perimeter of the exclusion zone will be monitored for LA fiber migration by collecting stationary air samples at the exclusion zone boundaries. Stationary air sample calibration and collection procedures will be conducted in accordance with the RASAP (Appendix A). Should perimeter air sampling indicate airborne off-site migration of LA, possible causes of such off-site migration will be investigated and evaluated, then any necessary improvements to the engineering controls (such as more careful working procedures, more wetting of soils, etc.) will be implemented.

5.5.2 Personal Breathing Zone Air Sampling

Personal breathing zone (BZ) air samples will be collected on personnel conducting contaminated soil removal to document that the level of respiratory protection is adequate for the task being conducted. All personal BZ sampling will be conducted in accordance with Appendix A. Tasks related to contaminated soil removal include, but are not limited to, water hose operator, excavator operator, vacuum hose operator, ~~truck driver,~~ and laborer. Personal BZ air sampling will consist of collecting one time weighted average (TWA) sample and one short-term exposure limit (STEL) (i.e., one 30-minute excursion) sample per job description, a minimum of once.

5.6 Removal Area Management

The property will be divided into several work areas for the cleanup activities: cleanup, decontamination, and site support. The cleanup contractor will control the movement of personnel and equipment between the areas. These controls will keep the contaminants within specified areas, reducing the potential for contaminant migration. The cleanup contractor will establish, maintain, and clearly mark the work areas with appropriate signage and barricades.

5.6.1 Control of Surface Water

Responsibility for the care of surface water will be borne by the cleanup contractor until completion of work. The cleanup contractor will provide the materials and the equipment to perform all work necessary to facilitate the control of the surface water and to protect the cleanup work from damage by water. Using temporary control measures, the cleanup contractor will be responsible for preventing surface water from running into the contaminated area of the exclusion zones and contaminated water from running off site. Stormwater will be controlled and diverted around the contaminated areas within the exclusion zones into the existing drainage systems. The cleanup contractor will utilize mobile pump trucks to remove water collected in the cleanup

zones. This water will be utilized for dust suppression or filtered through 2-micron filters then discharged to the city storm sewer system.

Stormwater and surface runoff from a completely excavated (to clearance criteria) but uncovered portion of the property will be diverted off of the property to the city storm sewer system or utilized for dust suppression. Dikes for this purpose will be constructed using onsite material to control surface water runoff from cross-contaminating clean sections of the property. If necessary, portable pumps will be used to remove any ponded water prior to covering the excavation.

5.6.2 Pollution Prevention

Material will not be allowed to enter and pollute any surface water or groundwater in the project area. Vehicles and equipment will be lubricated or fueled in a controlled manner. All cleanup contractor personnel and subcontractors will comply with applicable federal, state, and local laws concerning pollution of surface and groundwater. Special measures may be implemented such as dikes around equipment that requires refueling on site, to prevent chemicals, fuels, oils, greases, and other materials from entering public waters. Water used in personnel and equipment washing will be filtered through 2- micron filters prior to discharging to the city storm sewer system.

5.6.3 Dust Control

During the movement of the contaminated material, dust control measures will be maintained. ~~Except in areas where high voltage electrical equipment is located, the~~The cleanup contractor will use water tankers with power spray units for dust control and ~~a spray wash sprinkler~~ for dust abatement when loading the soil. Dust abatement is a fundamental method in eliminating contaminant migration during excavation. Stationary air sampling at the exclusion zone boundary and visual observations will be conducted to evaluate dust control measures to ensure that fibers do not migrate outside the exclusion zone. All excavations, embankments, stockpiles, permanent and temporary access ways, waste staging and storage areas, stabilization materials handling areas, and other work areas may cause a dust hazard to others. Water sprinkling, chemical surfactant treatment (as approved by the PacifiCorp Project Manager and EPA), and plastic sheathing will be employed to control dust. Sprinkling will be repeated to keep the disturbed area damp at all times. Water trucks designed for this task or water hoses and sprinklers will be used. Dust control will be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

5.6.4 Security

Security will be provided by the substation fence. The fence will be intact and all gates locked unless a guard is posted to ensure against unauthorized entry.

Section 6
Property Restoration

Following the completion of the removal of contaminated soils and interior cleaning, if required, the property will be restored to its approximate pre-cleanup condition.

The cleanup contractor will decontaminate and demobilize the equipment used for the removal of contaminated soils, or contaminated dust prior to restoration. All equipment used in the exclusion zone will be decontaminated prior to leaving the EZ.

6.1 Backfill and Final Grading

The excavation area will be examined for any conditions detrimental to continuing restoration, (e.g., if excavation areas are muddy or frozen). Backfill material will be inspected by the PacifiCorp representative and the cleanup contractor for adherence to specifications for its application. Stockpiles of backfill material may be established on site. Backfill material will be placed, compacted, uniformly graded and sloped to the desired contour of the land. To prevent ponding, backfill material will be graded to allow runoff to drain away from structures.

6.2 Fences and Other Items

Any fences, or other items removed during site preparation or cleanup will be reassembled or replaced in kind, as stated in the contract documents. Upon completion, these structures will be inspected for quality of work and durability, with comments recorded ~~in the daily quality control report~~.

Section 7

Progress Reporting

Monthly progress reports will be prepared by PacifiCorp's site agent. The monthly progress report will include tasks performed for the month, planned tasks for the next month, issues, cost summary, and schedule summary. These reports will be available to EPA, UDEQ and Salt Lake City Corporation on request.

Section 8

Schedule

Schedules will be prepared by the cleanup contractors and updated, as necessary~~, in the weekly progress reports~~. Schedules will be posted on the white board in the worksite office trailer.

Appendix A

Response Action Sampling and Analysis Plan for the PacifiCorp Property 147 South 400 West Salt Lake City, Utah

Response Action Sampling and Analysis Plan for PacifiCorp Property Salt Lake City, Utah

May 2004

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Acronyms

°F	Degrees Fahrenheit
AHERA	Asbestos Hazard Emergency Response Act
bgs	Below Ground Surface
BZ	Breathing Zone
CAR	Corrective Action Request
COC	Chain-Of-Custody
DQA	Data Quality Assessment
DQO	Data Quality Objectives
EDD	Electronic Data Deliverables
EPA	(United States) Environmental Protection Agency
EZ	Exclusion Zone
f/mm2	Fibers per Square Millimeter
FSDS	Field Sample Data Sheets
FSP	Field Sampling Plan
GPS	Global Positioning System
Grace	W.R. Grace Company
HASP	Health and Safety Plan
IDL	Instrument Detection Limit
LA t	Remolite, Actinolite, Richterite, and Winchite
NA	Not Applicable
ND	Non-Detect
NFG	National Functional Guidelines
NPE	Negative Pressure Enclosure
NVLAP	National Voluntary Laboratory Accreditation Program
OSC	On-Scene Coordinator
PCME	PCM Equivalent
PE	Performance Evaluation
PLM	Polarized Light Microscopy
PM	Project Manager
PPE	Personal Protective Equipment
QA	Quality Assurance
QAM	Quality Assurance Manager
QC	Quality Control
QMP	Quality Management Plan (see Order on Consent)
R&R	R&R Environmental , Inc.
RA	Removal Action
RASAP	Response Action Sampling and Analysis Plan
RAWP	Response Action Work Plan
SOP	Standard Operating Procedure
TWA	Time Weighted Average

Section 1 - Introduction

This document serves as the response action sampling and analysis plan (RASAP) for the cleanup efforts as part of the response action work plan (RAWP) for the PacifiCorp Property (also known as the 3rd West Substation). This RASAP outlines the sampling and analysis to be conducted during cleanup of contaminated soil and interior LA dust cleaning at the site.

This section provides a general explanation of the purpose of the RASAP for the RAWP and organization of this document. An expanded site background is available (3rd West Substation Site History Report, dated March 26, 2004); a brief history is provided in Section 2. The cleanup activities being completed at the PacifiCorp Property include the removal of residual dust and contaminated soil from an Electrical Substation structure and surrounding soils. The contamination encountered at the property is due to historic vermiculite processing, handling and transportation. The approach to the actual cleanup of these media is found in the text of the RAWP located in the main body of this document. During cleanup of the properties, sampling and analysis is conducted to ensure the contaminated material is removed to the cleanup criteria and to ensure the health and safety of the workers at the site and the public in the vicinity of the site. This includes sampling and analysis following removal of contaminated dust for clearance of the building structure being cleaned and following removal of contaminated soils to confirm that the contamination is removed from the excavation area; sampling will also be conducted during the removal of contaminated soil to ensure safety of the workers and the public is maintained throughout the cleanup.

This RASAP outlines the field sampling plan as it pertains to sampling completed during and after soil excavation and interior cleaning. The purpose of this RASAP is to describe the sampling objectives, locations, measurement methods, and the quality assurance (QA) requirements for sampling of the soil and air during cleanup efforts. The RASAP is organized as follows:

Section 1 - Introduction
Section 2 - Site Background

Part I: Field Sampling Plan (FSP)
Section 3 - Sampling Strategy, Locations, and Rationale
Section 4 - Field Activity Methods and Procedures

Part II: Quality Assurance Project Plan (QAPP)
Section 5 - Project Management
Section 6 - Measurement and Data Acquisition
Section 7 - Assessment and Oversight
Section 8 - Data Validation and Usability
Section 9 - References
Appendix A-1 - Standard Operating Procedures
~~Appendix A-2 - Air Sample Collection Procedures~~
~~Appendix A-3 - Request for Modification Forms~~

1.1 Objectives

This section defines objectives of the soil and air confirmation, air monitoring, and the intended use of the data. The primary objective of these efforts is to determine the presence of LA during and after soil excavation and dust removal at the PacifiCorp Property.
The specific objectives are to:

- Sampling during removal - confirmation soil sampling to ensure remaining media eets cleanup standards listed in the RAWP
- Sampling during removal - stationary air sampling to ensure that excavation is not spreading asbestos into the air
- Sampling after removal - stationary air and confirmation soil sampling to ensure what remains meets cleanup standards as defined by EPA and listed in the draft RAWP document
- Sampling throughout dust removal/excavation - breathing zone air sampling, a health and safety measure, to ensure workers are not being exposed to asbestos
    - Sampling will be ongoing for the duration of the cleanup activities at the site, which are anticipated to last several months.

1.2 Project Schedule and Deliverables

During removal operations, the results of the RASAP will be placed in the property cleanup files at the on-site office in Salt Lake City, Utah and maintained by PacifiCorp/R&R. Other project deliverables and schedules are discussed in the RAWP for this work (The main body of this document).

Section 2 - Site Background

This section describes the site location and the history.

2.1 Site Location

The PacifiCorp Property is located at 147 South 400 West, Salt Lake City in Salt Lake County, Utah (Figure 1-1 in the RAWP). The site includes energized high voltage electrical equipment typical of an electric utility distribution substation. Certain areas of the property are contaminated with asbestos fibers as a result of historic vermiculite handling and processing conducted in the area in years past.

2.2 Site History

A detailed history of the PacifiCorp Property site is available in a document entitled "3rd West Substation Site History Report", dated March 26, 2004. A portion of the PacifiCorp property and other nearby sites served as a transfer point and processing (expansion) area for vermiculite from Libby, Montana. Expansion (also known as "exfoliation" or "popping") was accomplished by heating the ore, usually in a dry kiln, to approximately 2,000 degrees Fahrenheit (°F). This process explosively vaporizes the water contained within the phyllosilicate structure causing the vermiculite to expand by a factor of 10 to 15. This produces the vermiculite material most commonly sold as thermal insulation and as soil conditioner for gardens and greenhouses. The

commercially exploited vermiculite was used in a variety of products, including insulation and construction materials, as a carrier for fertilizer and other agricultural chemicals, and as a soil conditioner.

According to Andrew Schneider and David McCumber, in "An Air that Kills: How the Asbestos poisoning of Libby, Montana uncovered a National Scandal", Libby Amphibole (LA) is a combination of rare asbestiform minerals that formed when a plume of magma rose up from the earth's mantle, pushed through the sedimentary deposits of the area, stopping about a mile below the surface. As the plume and subsequent plumes cooled, biotite was formed. Biotite is an unstable mineral, which, because of the abundant water available, metamorphosed into tremolite asbestos and other LA suite minerals. After tens of millions of years, vermiculite formed due to erosion and weathering.

Part I: Field Sampling Plan

Section 3 - Sampling Strategy, Locations, and Rationale

The field sampling plan (FSP) is included in Sections 3 and 4. This section describes the overall strategy for sampling conducted during cleanup activities.

3.1 Sampling Strategy

All soil within the demarcated contaminated area will be excavated to the minimum depth of 12 inches; in the "pit" area (where deeper contamination was found) excavation may go ~~as deep as 8 feet~~deeper. Excavation may be terminated at shallower depths if sampling indicates no contamination. ~~This will be determined by the R&R onsite representative.~~ Following the excavation of the contaminated soils within the demarcated area, the R&R onsite representative will inspect the sidewalls and bottom of the excavation. If there is vermiculite in large quantities still visible in the excavation, the cleanup/construction contractor will be directed to remove additional contaminated soil until, in the judgment of the R&R onsite representative, the remaining soils are expected to meet soil clearance criteria or a depth of three feet has been reached. At that point, either the ~~R&R~~EPA onsite representative will collect confirmation soil samples, or the PacifiCorp Project Manager will determine whether to keep digging or encapsulate and implement institutional controls.

3.1.1 Soil Confirmation

A confirmation sample will consist of a five-point composite (five sub samples submitted as one sample) surface (0 to 2 inches) soil sample covering an area where contaminated soil has been removed. It will be at the discretion of the ~~R&R~~ EPA onsite representative to decide how many samples will characterize the area being excavated. The number of confirmation samples collected daily will be dictated by the size of the excavation and progress of the cleanup/construction contractor. In general, at least one composite sample will be collected for every 625 square feet of excavation area. Soil sample collection procedures are discussed in Section 4.

3.1.2 Stationary Air Monitoring

During contaminated soil removal, the perimeter of the exclusion zone will be monitored for asbestos fiber migration by collecting stationary air samples at the exclusion zone boundaries. Daily perimeter monitoring will be conducted in calm weather at the compass points (north, east, south and west).

3.1.3 Personal Breathing Zone Monitoring

Personal breathing zone (BZ) air samples will be collected on personnel conducting contaminated dust and soil removal to document that the level of respiratory protection is adequate for the task being conducted. Sampling frequencies for personal BZ air monitoring shall be a minimum of 25% of the removal work force.

3.2 Quality Assurance/Quality Control (QC) Samples

The QA/QC measures taken for confirmation soil and clearance air sampling include analysis of field and/or laboratory QC samples, verification of analytical results through alternative methods, and laboratory systems audits and performance monitoring through the National Voluntary Laboratory Accreditation Program (NVLAP). Laboratory QA/QC must adhere to

method requirements unless defined differently in this RASAP. At the discretion of the EPA On-Scene Coordinator (OSC), data generated by polarized light microscopy (PLM) may be verified through alternative analytical methods, which are currently being developed by EPA in a performance evaluation study. If at any point this step is required, direction will be provided in the form of an addendum memorandum or modification form to this RASAP. Individual QA/QC requirements for each sample type are described below. Note that QC samples will not be used in decision making for site cleanup; rather, QC samples will only be used to assess the precision and accuracy of the field sampling and analysis efforts and to understand whether biases exist in the data as a result.

Confirmation Soil Sample QC
Individual QA/QC requirements for confirmation soil samples are:

- **Field Duplicates**. Due to the need for expedited soil sample results, field duplicates are not required for the removal action program.

- **Performance Evaluation Samples**. Performance evaluation (PE) samples may be inserted into the confirmation soil sample train to independently assess analytical accuracy. If at any point this step is implemented, direction on required frequency, acceptance criteria, and corrective action will be provided in the form of an addendum memorandum or modification form to this RASAP.

- **Sample Preparation.** Following receipt at the analytical laboratory, soil confirmation samples will be thoroughly homogenized then split. One sample split will be analyzed by the laboratory and the other returned under strict chain of custody to R&R for archival.

3.3 Clearance (Confirmation) Air Sample QC

Individual QA/QC requirements for air samples taken as part of the clearance assessment are defined below and summarized in Table 3-1:

- **Lot Blanks**. Lot blanks are prepared by submitting unused cassettes for analyses prior to putting the group (lot) of cassettes into use. Lot blanks will be collected and analyzed at a frequency of 2 per 100 cassettes from the same lot. The lot blanks will be analyzed by each of the following methods: NIOSH 7400 and TEM AHERA. Lot blanks will be identified on the chain-of-custody (COC) form, so that the analytical laboratory is aware of their use and can contact the laboratory coordinator immediately if asbestos fibers are detected on the filters. If the lot is proved to be contaminated with 7 or more fibers per cubic millimeter by NIOSH 7400, or 1 or more LA structures per square millimeter by TEM AHERA, then the lot of cassettes will be discarded and a new lot of cassettes will be used.

  Field blanks should be divided into two categories, those relating to clearance (confirmation) air samples and those relating to other air samples including breathing zone and stationary monitoring. Regardless of the type of field blank, they are all collected by removing the cap from the sample cassette at the time of sampling for not more than 30 seconds and then replacing the cap.

- **Field Blanks, Clearance Air Samples**. 2 field blanks will be collected per work zone (i.e., removal area). The field blanks will come from the same lot as the cassettes used that day for air sample collection. Both of the field blanks will be collected in the removal area, but in the vicinity of the location the ambient air samples are collected. The field blanks will be analyzed by TEM AHERA. If a field blank is contaminated with 1 or more LA structures per square millimeter, then the HSM will determine whether the occurrence displays a trend in contamination or is isolated. The HSM will also decide whether analysis of other archived field blanks is necessary. If it is determined that additional archived field blanks require analysis, they will be retrieved from archive at the analytical laboratory and analyzed. Field blank results will be evaluated to determine if field blank contamination is a sample collection procedure deficiency. If at any time field blank contamination appears to be a consistent deficiency in sample collection technique, PacifiCorp or R&R may immediately recommend additional formalized sample collection training and/or an increase in the frequency of field blanks submitted for analysis. If this is implemented, direction on required frequency, acceptance criteria, and corrective action will be provided in the form of an addendum memorandum or modification form to this RASAP.

- **Field Blanks, Breathing Zone/Stationary Air Monitoring Samples**. One field blank will be collected per day of air sampling. The field blank cassettes will come from the same lot as the cassettes used that day for air sample collection. One field blank will be analyzed per week. The remainder of the field blanks collected, but not analyzed, will be submitted to the analytical laboratory marked for archive. The field blanks will be analyzed by each of the following methods: NIOSH 7400 for breathing zone monitoring field blanks or TEM AHERA for stationary monitoring field blanks. The field blanks sample results will be reviewed by the HSM. If a field blank is contaminated with 7 or more fibers per cubic millimeter by NIOSH 7400, or 1 or more LA structures per square millimeter by TEM AHERA, then the HSM will determine whether the occurrence displays a trend in contamination or is isolated. The HSM will decide whether analysis of other archived field blanks is necessary. If it is determined that additional archived field blanks require analysis, they will be retrieved from archive at the analytical laboratory and analyzed. Field blank results will be evaluated to determine if field blank contamination is a sample collection procedure deficiency. If at any time field blank contamination appears to be a consistent deficiency in sample collection technique, PacifiCorp or R&R may immediately recommend additional formalized sample collection training and/or an increase in the frequency of field blanks submitted for analysis. If this is implemented, direction on required frequency, acceptance criteria, and corrective action will be provided in the form of an addendum memorandum or modification form to this RASAP.

Table 3-1 QC Sample Requirements for Clearance (Confirmation) Air Samples

QC Sample	Air Sample Type	Frequency	Acceptance Criteria (b)	Corrective Action
Lot Blank	Final Clearance Personal Breathing Zone Stationary	2 per 100 cassettes of the same lot number (a)	1. Analyze & apply acceptance criteria prior to ever using the cassettes for sample collection. 2. <7.0 f/mm3 (method detection limit using NIOSH 7400) 3. ND for LA (TEM AHERA with site-specific modifications)	Do not use the lot of cassettes for sampling if acceptance criteria are not met.
Field Blank	Final Clearance	2 per work area - 2 field blanks collected per NPE, one will be analyzed and one will be archived	ND for LA (TEM AHERA with site-specific modifications)	Analyze archived blank to determine if contamination on first blank is an isolated occurrence. If the contamination in the field blank does not appear to be a trend, no action is required. If a trend in contamination is apparent, re-train the sampler(s) and continue to monitor the problem until resolved. Field blanks contaminated with LA will be considered when determining if the work area meets final clearance criteria (i.e., if re-cleaning and clearing the work area is warranted).
Field Blank	Breathing Zone Perimeter Monitoring	1 per day of air sampling	1. <7.0 f/mm2 (Method Detection Limit using NIOSH 7400) (b) 2. ND for LA (TEM AHERA with site-specific modifications)	Evaluate the field blank results to determine if contamination is an isolated occurrence. If the contamination in the field blank does not appear to be a trend, no

				action is required. If a trend in contamination is apparent, re-train the sampler(s) and determine if an increase in the frequency of field blanks analyzed is required. Associated field sample results may be qualified. If necessary, other field blanks collected by the sampler should be retrieved from archive and analyzed.

f/mm2 fibers per square millimeter
ND non-detect for Libby Amphibole
NPE negative pressure enclosure
(a) Frequency requirements are based on the lot number, not on the air sample type.
(b) Acceptance criterion is based upon calculations that assume 5.5 fibers per 100 fields analyzed by NIOSH 7400

Section 4 - Field Activity Methods and Procedures

The following is a summary of field activities that will be performed by R&R personnel for soil and air sampling:

- Mobilization
- Procurement of equipment and supplies
- Documentation of field activities
- Photographic documentation
- Field sampling methods and procedures
- Decontamination procedures

4.1 Mobilization

Prior to the mobilization for field activities, a field planning meeting will be conducted by the HSM and attended by the contractor and consultant. ~~The agenda will be reviewed and approved by the PacifiCorp PM prior to the meeting.~~ The meeting will be to briefly discuss and clarify:

- Objectives and scope of the fieldwork
- Equipment and training needs
- Field operating procedures, schedules of events, and individual assignments
- Required QC measures
- Health and safety requirements
- Documents governing fieldwork that must be on site

- Any changes in the field plan documents

~~A written agenda, reviewed by the QAM, will be distributed and an attendance list signed. Copies of these documents will be maintained in the project files.~~ Additional meetings will be held when ~~the documents governing fieldwork require it or when~~ the scope of the assignment changes significantly.

The field team personnel will perform the following activities before and during field activities, as applicable:

- Review and understand the FSP and comprehensive site health and safety plan (CSHASP)
- Ensure that all sample analyses are scheduled through the designated laboratory
- Obtain required sample containers and other supplies
- Locate hospital
- Obtain and check field sampling equipment
- Obtain personal protective equipment (PPE)
- Turn samples with chain of custody over to the QA manager or the HSM

4.2 Equipment, Supplies, and Sample Containers

The equipment listed below ~~will be required~~ is suggested for sampling activities.

Soil Sampling:

- Potable water/distilled water
- Field logbook
- Indelible ink pen
- Digital camera
- Sample containers
- Sample paperwork
- Sample tags/labels
- Custody seals
- Nylon-fiber strapping tape
- Plastic 2-gallon baggies (zipper-top)
- Soap
- Garbage bags
- Paper towels
- Scrub brushes
- Plastic samplers (e.g., plastic trowels or scoops)
- Garden sprayer
- PPE

Air sampling:

- Low flow pumps
- Low flow pump charger
- ~~Primary calibration instrument (dry cal)~~
- Cassette stands
- ~~20 inch box fan~~

- ~~1 horsepower leaf blower~~
- 0.8 µm pcm cassettes
- ~~Teflon tape~~
- ~~Extension cords~~
- Rotometer
- ~~GFCI three way extension splitter~~
- Tygon tubing
- Calculator
- ~~Rubber made storage boxes~~
- ~~Kneepads~~
- ~~Utility knife~~
- ~~Tape measure~~
- ~~Compass~~
- Ballpoint pens
- Permanent markers
- Duct tape
- ~~Nitrile gloves~~
- Alcohol wipes
- ~~High volume pumps~~
- ~~Flow regulators~~
- ~~Nylon leur adapter~~
- ~~0.45 microvac cassettes~~
- Clipboard
- Logbooks
- Scissors
- File tote
- ~~Distilled water~~
- Paper towels
- Digital camera

4.3 Field Documentation

Information and notations will be recorded as required in the applicable field logbook. In addition, field sample data sheets (FSDSs) will be completed for each sample in order to capture pertinent tracking information, such as sample date and time, specific location, and logbook reference, for entry into the PacifiCorp project database. To ensure that sample information is consistent and retrievable from the site and database, all field sampling personnel will be instructed on proper FSDS completion by the HSM prior to field work.

4.4 Field Instrument Calibration and Maintenance

No field measurements will be collected during this inspection and, therefore, no field instruments will be used.

4.5 Photographic Documentation

Photographs will be taken with a digital camera at ~~each sample location and at~~ any place that the field sampling personnel determine necessary. Electronic photo files will be saved each day to a project-designated computer housed on-site ~~and named~~ so that photos ~~for a particular activity~~

(e.g., bulk substrate removal, interior dust removal, etc.) can easily be retrieved. The photo file naming convention is as follows:

PacifiCorp_3rdW_RM_Inside_Prep_22_110404

Where:

PacifiCorp_3rdW is the address where removal activities occurred
RM designates a removal-related photo (versus other phases of project work)
Inside defines the phase of work (as opposed to "Outside")
Prep (preparation) defines the activity being documented
22 designates the number of the photo taken at that property that day
071504 designates the date (mmddyy) the photo was taken

Following completion of removal activities, all photo files pertaining to a property will be copied onto a CD and filed along with other property-specific documentation.

4.6 Field Sampling Methods and Procedures

This section provides a list of SOPs, including project-specific SOPs. The project specific procedure will be followed during this removal project. For additional information, field personnel will refer to the SOPs included in Appendix A-1. and Appendix A-2 provides procedures specific to air sample collection). The CSHASP should be consulted to determine health and safety protocols for performing site work. Prior to initiating field activities, the HSM will review and discuss the RASAP and CSHASP with the contractor and consultant. The contents of each Appendix-1 are listed below.

Field Activity methods and Procedures

Appendix A-1 – R&R Standard Operating Procedures (R&R 2002a:

- Sample Custody (SOP 1-2)
- Surface Soil Sampling (Modified SOP 1-3)
- Packaging and Shipping of Environmental Samples (Modified SOP 2-1)
- Guide to Handling of Inspection-Derived Waste (Modified SOP 2-2)
- Field Logbook Content and Control (SOP 4-1)
- Photographic Documentation of Field Activities (Modified SOP 4-2)
- Field Equipment Decontamination at Non-Radioactive Sites (Modified SOP 4-5)
- Completion of Field Sample Data Sheets (FSDS) (project-specific SOP)
- Electronic Chain-of-Custody (project-specific SOP)

Appendix A-2 Air Sample Collection Procedures:

- EPA SOP 2015; 11/17/94 Revision 0.0, for calibration of all air samples and stationary air sample collection

- 29 CFR 1926.1101 Appendix B; Sampling and Analysis - Non-mandatory, for personal breathing zone air sample collection
- TEM AHERA (40CFR Part 763 Subpart E), for final clearance air sample collection

~~**Appendix C — Request for Modification Form:**~~

- ~~Record of Deviation/Request for Modification Form~~

4.7 Decontamination Procedures

Sampling methods have been selected to reduce the amount of equipment that needs to be decontaminated (i.e., by choosing either dedicated or disposable items). If a piece of equipment needs to be used to collect more than one sample (i.e., comes into contact with more than one sample material), that piece of equipment will be decontaminated in accordance with R&R SOP 4-5, Field Equipment Decontamination
at Non-radioactive Sites with modification and confirmation soil sampling procedures (Appendix A-1).

Part II:
Quality Assurance Project Plan

Section 5 - Project Management

This RASAP supports the ~~draft~~ RAWP for the PacifiCorp site. This RASAP was prepared in accordance with EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Final (EPA 2001). This section covers the basic area of project management, including the project organization, background and purpose, project description, quality objectives and criteria, special training, and documentation and records. Appendix A-1 includes a copy of applicable R&R SOPs. ~~(R&R 2002b) while Appendix A-2 includes air sample collection procedures.~~

5.1 Project Organization

Organization and responsibilities specific to this removal action are discussed in this section. R&R will provide the necessary technical and field staff to perform sampling and reporting aspects of the project. Analytical services are provided through a contract laboratory.

5.1.1 EPA Region VIII

The EPA on-scene coordinator (OSC), Mr. Floyd D. Nichols, is PacifiCorp's primary federal agency contact for coordinating response action work at the PacifiCorp Property. Mr. Nichols, as OSC, is responsible for the management and coordination of the following activities:

- Defining the scope of the ~~draft~~ response action
- Defining data quality objectives
- Reviewing all project deliverables
- Maintaining communications with the PacifiCorp project manager for updates on the status of the response action activities
- Provideing for technical review and the return of consolidated comments on the various technical documents submitted for review
- Act as the lead Federal agency at the site

5.1.2 PacifiCorp

The PacifiCorp project manager (PM), Mr. David Wilson, is the primary contact for coordinating response action work at the PacifiCorp Property. Mr. Wilson is responsible for the management and coordination of the following activities:

- Defining the sampling scope
- Defining data quality objectives
- Reviewing all project deliverables
- Reviewing monthly status reports
- Providing oversight of the sampling
- Assuring that plans are implemented properly
- Informing personnel of any special considerations associated with the project
- Providing site access, if necessary
- Reviewing work progress for each task
- Reviewing and analyzing overall performance with respect to goals and objectives

5.1.3 R&R Environmental, Inc. (R&R)

The R&R management team will be comprised of the following positions: Health and Safety Manager (HSM) and project Quality Assurance Manager (QAM).
The following personnel are assigned to this project:
Health and Safety Manager David Roskelley
Quality Assurance Manager Eldon Romney

Mr. Roskelley, as HSM, is responsible for the overall management and coordination of the following activities:

- Maintaining communications with EPA and PacifiCorp regarding the status of this project
- Supervising production and review of deliverables
- Reviewing analytical results
- Tracking of planned budgets and schedules
- Procuring non-laboratory subcontractors, when necessary
- Providing oversight of data management
- Using sampling data in site remediation decision making
- Preparing monthly status reports
- Reviewing analytical results
- Overseeing operation and maintenance activities
- Scheduling consultant personnel and material resources
- Providing oversight of ~~daily and~~ periodic report preparation
- Coordinating work activities including sampling
- Notifying the responsible QA staff immediately of significant problems affecting the quality of data or the ability to meet project objectives
- Implementing field aspects of the project, including this RASAP and other project documents
- Organizing and conducting periodic meetings with onsite facility personnel
- ~~Implementing the QC measures specified in R&R's Quality Management Plan (QMP) (R&R 2003a) and other project documents~~
- Implementing corrective actions resulting from staff observations, QA/QC surveillances, and/or QA audits
- Ensuring that sampling is conducted in accordance with pertinent R&R SOPs and that the quantity and location of all samples meet the requirements of this RASAP
- Scheduling and conducting required sampling and monitoring activities
- Preparing and shipping samples to the analytical laboratories
- Ensuring electronic data entry from FSDSs into the onsite sample tracking database
- Generating COC forms and ensuring adherence to sample custody procedures (e.g. use of custody seals by the samplers)
- Coordinating with the laboratories regarding sample deliveries/shipments and following up with result reporting
- Receiving and distributing air monitoring and soil confirmation sample results to The PM, the OSC and removal oversight personnel, as applicable

Mr. Roskelley is also responsible for ensuring transmittal of project documentation to PacifiCorp and to the project file repositories.

Mr. Roskelley will:

- Ensure the work is conducted according to this document
- Conduct ~~soil~~ sampling ~~and air sampling~~ per the RAWP and in accordance with procedures presented herein
- Act as the field health and safety coordinator
- Ensure all work will be conducted in accordance with the site-specific HASP that governs the field activities outlined in this RASAP
- Be responsible for ensuring that the protocols specified in the HASP are carried out during field activities
- Ensure that copies of the HASP are maintained at the Site at all times
- Supervise the upgrading or downgrading of the level of protection in accordance with the HASP, based on the existing site conditions
- Conduct an initial health and safety meeting, providing an overview of the HASP to all assigned field personnel, ~~and have them sign a form to indicate they understand the content of the HASP document and will adhere to its specifications~~
- Function as the R&R health and safety manager (for issues that arise during field activities) and the laboratory coordinator, responsible for the procurement of laboratories subcontracted by R&R
- Ensure that all laboratories meet project requirements for data reporting
- Serve as the database manager for the onsite sample tracking database and be responsible for the development and maintenance of the onsite database to ensure project tracking needs are met

5.1.4 Quality Assurance Organization

The Quality Assurance Manager (QAM), Mr. Eldon Romney, implements the QA program. The QAM is independent of the technical staff and is the president of R&R. The QAM thus has the authority to objectively review projects and identify problems and the authority to use corporate resources as necessary to resolve any quality-related problems. Mr. Romney is also responsible for the following:

- Verifying that corrective actions resulting from staff observations, QA/QC surveillances, and/or QA audits are implemented
- Reviewing and approving the project-specific plans
- Directing the overall project QA program
- Maintaining QA oversight of the project
- Reviewing QA sections in project reports, as applicable
- Reviewing QA/QC procedures applicable to this project
- Auditing selected activities of this project performed by R&R and contractors, as necessary
- Initiating, reviewing, and following up on response actions, as necessary
- Maintaining awareness of active projects and their QA/QC needs
- Determining appropriate QA/QC measures and corrective actions
- Conducting internal system audits to check on the use of appropriate QA/QC measures, if applicable
- Arranging performance audits of measurement activities, as necessary
- Providing monthly written reports on QA/QC activity to the PM

5.1.5 Report Organization

This RASAP is organized in accordance with EPA QA/R-5 guidance for preparing RASAP (EPA 2001). This section (Section 5) presents project management and introductory information. Section 6 provides guidance for measurement and data acquisition. Section 7 describes assessment and oversight aspects of the project, and Section 8 describes data validation and usability issues. References are provided in Section 9.

5.2 Background and Purpose

A site ~~Site~~ background ~~and a description of the process equipment and structures are~~is provided in Section 2 of this RASAP. The purpose and objectives of this project are discussed in Section 1.1 of this RASAP. The purpose of this RASAP is to provide guidance to ensure that all environmentally related data collection procedures and measurements are scientifically sound and of known, acceptable, and documented quality and conducted in accordance with the requirements of the project.

5.3 Project Description

A description of this project is provided in Section 1 of this RASAP. Samples will be analyzed for parameters listed in Section 5.4. Sampling activities and all associated procedures are described in detail in this RASAP.

5.4 Quality Objectives and Criteria for Measurement

This section provides internal means for control and review of the project so that environmentally related measurements and data collected are of known and acceptable quality. The subsections below describe the data quality objectives (DQOs) (Section 5.4.1) and data measurement objectives (Section 5.4.2).

5.4.1 Data Quality Objectives

To accomplish the project goals, the RAWP/RASAP calls for the sampling and analysis of a variety of media for various purposes. For convenience and to clarify the specific purpose of each sampling and analysis program, the DQOs are organized separately by medium and respective purpose. Whenever possible, this is accomplished in tabular form. As shown, the various DQOs are segregated into the following: ~~(1) Soil Confirmation Samples,~~ (21) Personal Air (BZ) Samples, (32) Perimeter Monitoring Air Samples, (3) Soil Confirmation Samples, (4) Air Confirmation for Indoor Dust Removal.

Step 1: State the Problem

Identify the planning team members including the decision makers:

All project personnel are detailed in Section 5.1. The decision makers for the activities described in this RASAP are Floyd Nichols (EPA OSC), David Wilson (PacifiCorp PM), and David Roskelley (HSM).

Describe the problem:

Previous studies were designed to characterize LA contamination at residential and commercial properties in and around Libby, Montana. Removal activities were performed at residential and commercial properties that were found to contain LA asbestos-contaminated VCI, interior dust, and/or exterior soils. During removal activities on those properties (~~i.e.~~e.g., excavation of contaminated soil), the potential for LA fibers to migrate offsite increased. Likewise, during

those activities, the potential for LA exposure to workers also increased. This experience indicates it is important to ensure worker safety and contaminant containment through periodic monitoring. Following cleanup, confirmation samples must be collected and analyzed expeditiously to determine if the removal actions met project goals. Therefore, a program must be put in place to monitor: (1) worker exposure and contaminant containment during removal activities; and (2) the effectiveness of the cleanup (i.e., confirmation) following removal activities.

Determine resources:

R&R's current task order under PacifiCorp provides a detailed description of resources, budget, and schedule for sampling and analysis response activities.

Step 2: Identify the Decision

Identify the principle study question, alternative actions, and decision statements:
The principle study question(s), alternative actions, and decision statements are summarized in Table 5-1.

Table 5-1 Identify the Decision

Data Quality Objective	Sample Description	Principle Study Question(s)	Alternative Actions	Decision Statements
RA Monitoring	Personal (BZ) Air Monitoring	Is LA detected in the workers' breathing zone above worker safety limits?	1. Continue contaminated soil removal and re-evaluate engineering controls, work practices, and/or PPE 2. Stop work 3. Take no action	Are LA fibers collecting in the workers' breathing zone above worker safety limits? If yes, engineering controls, work practices, and/or PPE will be re-evaluated and/or work will stop. If no, cleanup activities will continue with no additional evaluation.
RA Monitoring	Perimeter Air Monitoring	Are LA fibers detected in air along the perimeter of the exclusion zone boundary of an exterior cleanup site?	1. Continue contaminated soil removal and re-evaluate engineering controls and work practices 2. Take no action	Are LA fibers migrating to the exclusion zone boundary during LA contaminated soil removal? If yes, engineering controls and/or work practices, will be re-evaluated and/or work will stop. If no, excavation activities will continue with no additional evaluation.
RA Confirmation	Soil Confirmation	Is LA detected in the soil surface of the excavated area, after soil removal? If so, has the maximum excavation depth of 12 inches been achieved?	1. Excavate additional soils 2. Stop excavation and designate as either a non-contaminated area or an area of no further removal action	If LA is detected and maximum excavation depth is not achieved: 1. Excavate additional soils 2. Continue until no LA is detected or max. excavation depth achieved ~~3.~~ If no LA is detected and maximum excavation depth is not achieved: 1. Stop excavation and designate as a non-contaminated area ~~(if [LA] is ND)~~

				Max. excavation depth is achieved: 1. Continue excavating additional soils IF LA ≥1% 2. Stop excavation and designate as either a non-contaminated area (if LA is ND) or an area of no further removal action (if ND<LA<1%)
RA Confirmation	Air Confirmation for Interior Dust Removal	Is LA detected in the air within an NPE after the removal of LA-contaminated dust?	1. Re-clean NPE space 2. Take no action	Does the air in the space that was previously contaminated with LA in the indoor dust contain LA above clearance levels? If yes, the area will be re-cleaned. If no, the area will be deemed non-contaminated.

RA Removal Action
BZ Breathing Zone
NPE Negative Pressure Enclosure
PPE Personal Protective Equipment

Step 3: Identify the Inputs to the Decision

Identify the information needed. Determine the basis for determining the Action Levels. Identify sampling and analysis methods that can meet the data requirements.

The information needed for the decision, the action levels, the basis for the action levels, and analytical method summaries are provided in Table 5-2. Analytical results (that are confirmatory and do not serve to characterize contamination) are needed within hours of sampling so that excavation/cleanup work may continue with relative continuity. As such, confirmation soil samples will not be ground and will be analyzed via PLM NIOSH 9002.

Table 5-2 Inputs to the Decision

Data Quality Objective	Sample Description	Information Needed	Action Level	Basis for Action Level	Analytical Method
RA Monitoring	Personal Breathing Zone Air Monitoring	Reported Result: ASPCM: 1 f/cc ASTEM: 0.005 S/cm3 Min. Volume: 25 L (a) Collect: TWA: 8-hour STEL: 30-minute excursion sample	TWA: 0.1 PCME f/cc STEL: 1.0 f/cc	OSHA Worker Safety Regulations (1926.1101)	PCM: NIOSH 7400 TEM(d): TEM AHERA with site-specific modifications
RA Monitoring	Perimeter Air Monitoring	ASTEM: ~0.005 S/cm3 Min. Volume: 1200 L Collect: 4 samples, min. along north, south, east & west boundaries of EZ	Each air ample <ASTEM Approx. <0.005 S/cm3	Removal Action Clearance Criteria (b)	TEM AHERA with site-specific modifications
RA Confirmation	Soil Confirmation	Reported Result: % LA by VAE as: Method defined as 1%, but qualitative estimates of LA present below 1% reported as <1%, <0.2%, or ND Approx. Mass: 1 kilogram	Up to max. cleanup depth of 12 inches: ND Below max. cleanup depth: <1% LA by VAE ~~(a)~~ (b)	Removal Action Clearance Criteria (b), (c)	Analysis: NIOSH 9002
RA Confirmation	Air Confirmation for Indoor Dust Removal	ASTEM:~0.005 S/cm3 Min. Volume: 1200 L Collect: 5 samples of disturbed air within NPE	Each of 5 samples of disturbed air <ASTEM Approx. <0.005 S/cm3	Removal Action Clearance Criteria (b)	TEM AHERA with site-specific modifications

AS Analytic Sensitivity al
L Liters
RA Response Action
ND Non-detect
VAE visual area estimation

f/cc fiber per cubic centimeter
S/cm3 Libby Amphibole structures per cubic centimeter of air
TEM AHERA All samples are analyzed by transmission electron microscopy using the counting method as described in the Asbestos Hazard Emergency Response Act (AHERA) (EPA 1987) with site-specific modifications
NPE negative pressure enclosure
a Minimum volume requirements according to the method are 25 L. However, in order to achieve a reasonable analytical sensitivity by TEM, the sampler should attempt to collect 400 L of air for the BZ sample.
b Action Level/Clearance Criteria Technical Memorandum (EPA 2003a).
c As stated in the technical memorandum (EPA 2003b) efforts will be made to avoid having to repeat cleanup activities at a property by cleaning soils at the residential or commercial property to ND up to the maximum cleanup depth of 12 or 18 inches (yard soil/driveway or specific use areas, respectively). Excavation beyond the maximum cleanup depth will only continue if soils have concentrations exceeding 1% LA.
d If PCM results are above the OSHA PEL, TEM AHERA confirmation must be performed.
e Approximately 0.5 kg for analysis and 0.5 kilogram for archival

Step 4: Define the Study Boundaries

Define the target population, spatial and temporal boundaries, potential constraints, and the smallest subpopulation.

The target population, spatial and temporal boundaries, potential constraints, and the smallest subpopulation are summarized in Table 5-3.

Table 5-3 Study Boundaries

RA Monitoring	Personal Breathing Zone Air Monitoring	Ambient air within the workers' breathing zone; during removal activities	Each individual worker's breathing zone for the task performed	Collected during exterior or interior removal activities (i.e., removal, interior cleaning)	NA	1 air sample for each Level C task (e.g., laborer, bulk removal, operator, etc.) per week.
RA Monitoring	Perimeter Air Monitoring	Ambient air at the boundary of the EZ; during removal activities	Vertical: Air space above the exclusion zone to sampling height (~4-6 feet) Horizontal: perimeter bounding the site-specific EZ	Collected during exterior removal activities (i.e., excavation)	Inaccessibility due to property boundaries or other obstacles Inclement weather such as rain that can cause the sample to be void	4 air samples that bound the EZ
RA Confirmation	Soil Confirmation	Surface soil at the bottom of the excavation site; after soil removal activities	Vertical (a): Yard Soils: 12 inches bgs to ground surface Horizontal: site-specific EZ	Collected after all contaminated soil is excavated and removed from the site and will continue until the area is designated as either non-contaminated or removal actions are discontinued (no further action)	No soil available for sampling because excavation continued to bedrock	1 composite soil sample for every 625 ft2 excavated
RA Confirmation	Air Confirmation for Indoor Dust Removal	Ambient air within the functional space that was previously contaminated with LA; after removal activities	Vertical: Floor surface to the ceiling of the functional space that contained LA contamination Horizontal: air space contained within the area/NPE where LA dust was removed	Collected after all LA is removed from the functional space that contained LA and the area is designated non-contaminated	NA	5 air samples (cartridges) per EZ/functional space

EZ Exclusion Zone
RA Removal Action
bgs below ground surface
NA not applicable .

a These are generally the vertical boundaries for soil. If LA contamination 1% is found, the vertical boundary shall be extended for that location until the concentration is below 1% LA, to a maximum depth of 3 feet. If gross contamination is encountered at this depth, excavation will continue until the gross contamination is removed.

b A general schedule/timeline for cleanups is provided in the RAWP. This section is specific to timeframes for sampling at a particular property and/or exclusion zone.

c If it is raining, attempts will be made to protect the sample from moisture.

Step 5: Develop a Decision Rule

Population Parameter, Action Levels, Decision Rule:

The population parameter, action levels, and decision rules are summarized in Table 5-4.

Table 5-4 Decision Rule

Data Quality Objective	Sample Description	Population Parameter	Action Level	Decision Rule
RA Monitoring	Personal Breathing Zone Air Monitoring	1 air sample representing the breathing zone for the activity conducted	TWA: 0.1 PCME f/cc STEL: 1.0 f/cc	If the concentrations of the BZ samples 0.1 f/cc engineering controls, work practices, and/or PPE will be re-evaluated and/or work will stop. If no, cleanup activities will continue with no additional evaluation.
RA Monitoring	Perimeter Air Monitoring	4 air monitoring samples that bound the perimeter of the EZ	Each air sample <ASTEM Approx. <0.005 S/cm3	If the concentration of any of the 4 samples 0.005 S/cm3, then excavation engineering controls and work practices will be re-evaluated and/or work will be stopped. If all 4 perimeter air samples are ND, then no action will be taken.
RA Confirmation	Soil Confirmation	Composite Soil Sample representing the area of excavation, per 625 ft2	Up to max. cleanup depth of 12 inches: ND Below max. cleanup depth: <1% LA by VAE (a), (b)	If LA is detected and maximum excavation depth is <u>not achieved</u>: 1) Excavate additional soils at approx. 6 inch intervals 2) Continue until no LA is detected or max. excavation depth achieved ~~3)~~If LA is <u>not</u> detected and maximum excavation depth is <u>not achieved</u>: 1) Stop excavation and designate as a non-contaminated area ~~(if [LA] is ND)~~ Max. excavation

				depth is achieved: 1) Continue excavating additional soils at the discretion of the PM if LA ≥1% 2) Stop excavation and designate as either a non-contaminated area (if LA is ND), or an area of no further removal action (if LA<1%)
RA Confirmation	Air Confirmation for Indoor Dust Removal	Sum of all fibers observed on 5 interior cleaning confirmation samples per NPE	Each of 5 samples of disturbed air less than ASTEM ~<0.005 S/cm3	If the concentration of any of the 5 samples of disturbed air is 0.005 S/cm3, then the functional space will be re-cleaned and subsequently re-sampled. If the concentration of any of the 5 samples of disturbed air <0.005 S/cm3, the functional space will be designated non-contaminated.

EZ Exclusion Zone
RA Removal Action
PCME PCM Equivalent
TWA Time Weighted Average
a Action Level/Clearance Criteria Technical Memorandum (EPA 2003a).
b Excavation beyond the maximum cleanup depth will only continue if soils have concentrations 1% LA

Step 6: Specify Tolerable Limits on Decision Errors

Null Hypotheses, consequence of making an incorrect decision, gray region, tolerable limits:

For the purposes of completing all six steps of the DQO process, the null hypotheses and consequences of making an incorrect decision are summarized in Table 5-5. However, the gray region and tolerable limits on decision errors are not proposed because they are not applicable in this case.

Typically, Step 6 of the DQO process is useful to encourage careful design of decision rules by defining and integrating the errors that are acceptable based upon myriad integrated project management decisions such as reduction in risk to human health, implementability/practicability, and cost. As stated in the guidance document for development of DQOs: QA/G-4 (EPA 2000),

solely statistically generated tolerable limits on decisions errors are not necessary in certain cases, providing a line of reasoning (scientific justification) is presented that adequately defines acceptable limits or decision errors. This particular effort was put forth in the Action Level/Clearance Criteria Technical Memorandum for the following DQOs: (1) Soil Confirmation Samples, (2) Perimeter Monitoring Air Samples, and (3) Air Confirmation for Indoor Dust Removal. The decision rule for the personal (BZ) air monitoring samples has been promulgated by legislation, and as such, limits on decision errors do not apply.

Table 5-5 Limits on Decision Errors

Data Quality Objective	Sample Description	Null Hypothesis	Type 1 Error Will Result In:	Type 2 Error Will Result In:
RA Monitoring	Personal (BZ) Air Monitoring	The BZ air is contaminated with LA above the worker safety action levels.	Determining that the BZ air is not contaminated with LA above the worker safety action levels when it actually is. This in turn, results in an increased risk to workers performing removal actions.	Determining that the BZ air is contaminated with LA above the worker safety action levels when it is not. This in turn, results in re-evaluating engineering controls, possibly stopping work, or increasing the level of PPE when it is not necessary and adds unnecessarily to clean up costs.
RA Monitoring	Perimeter air monitoring	The perimeter air is contaminated with LA	Determining that the air is not contaminated with LA when it actually is. This in turn, results in an increased risk to human health.	Determining that the perimeter air is contaminated with LA when it is not. This in turn results in re-evaluating engineering controls and possibly stopping work when it is not necessary and adds unnecessarily to clean up costs.
RA Confirmation	Soil confirmation	The soils below an excavation are still contaminated with LA after removal.	Determining that the surface soils at the bottom of the excavated area are not contaminated with LA when they actually are. This in turn results in an increased risk to human health.	Determining that the surface soils at the bottom of the excavated areas are contaminated with LA when they are not. This in turn results in excavation of additional soils, or implementing institutional controls when it is not necessary and adds unnecessarily to ~~clean up~~ costs.
RA Confirmation	Air confirmation for indoor dust removal.	The functional space that was previously contaminated with LA is still contaminated with LA after removal.	Determining that the NPE that previously contained LA-laden dust is not contaminated with LA after removal	Determining that the NPE that previously contained LA-laden dust is contaminated with LA after removal

			when it actually is. This in turn results in an increased risk to human health.	when it is not. This in turn results in unnecessary re-cleaning of the NPE and adds unnecessarily to clean up costs.

Step 7: Optimize the Design for Obtaining Data

Using data previously generated for the site, the DQOs have been designed to support the proposed removal activities for the RAWP and represent the best possible project planning effort. However, in implementing the RAWP/RASAP, unforeseen situations may arise or team members may find more efficient means to carry out some of the day-to-day activities. Therefore, team members are always afforded the opportunity to recommend optimization of the data gathering design. Recommendations must come through proper channels as described in Section 5.1 and documented using ~~either a modification form or~~ an addendum to the RAWP. All modifications or addenda must be approved prior to making the proposed changes.

5.4.2 Data Measurement Objectives

Every reasonable attempt will be made to obtain a complete set of usable field measurements and analytical data. If a result cannot be obtained or is rejected for any reason, the effect of the missing data will be evaluated and ~~transmitted to EPA~~documented. In addition, the Surface Soil Sampling SOP provides guidance to ensure that the samples obtained are representative of the media at the Site.

5.4.2.1 Quality Assurance Guidance

The field QA program has been designed in accordance with EPA's Guidance for the DQO Process (EPA 2000), and the EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA 2001).

5.4.2.2 Field Measurements

No field measurements are conducted during this RA, therefore, no calibrations or maintenance are required.

5.4.2.3 Laboratory Analysis

Samples collected under this Appendix will be analyzed for parameters listed below using methods in parentheses. The analytical methods are as follows:

Soil clearance samples - PLM (NIOSH 9002 Issue 2)
Personal air samples - PCM (NIOSH 7400 Issue 2)
Stationary air samples - TEM AHERA (40CFR Part 763 Subpart E)
Air clearance samples - TEM AHERA (40CFR Part 763 Subpart E)

Samples will be submitted to contract laboratories. Prior to shipping samples, sampling personnel will ensure that the laboratories are ready to receive and analyze samples, can provide necessary data packages, and can provide an electronic copy of the data. The laboratories will submit analytical data reports to HSM or QAM. The data reports will contain a case narrative that briefly describes the number of samples, the analyses, and any noteworthy analytical difficulties or QA/QC issues associated with the submitted samples. The data report will also

include signed COC forms, cooler receipt forms, analytical data, and a QC package. The laboratories will provide an electronic copy of the data to the HSM or QAM.

Analytical Sensitivity and Reporting Limits The reporting limits provided in Table 5-2 are the minimum levels that the laboratories will report without a qualifier. If the result is between the instrument detection limit (IDL) and the reporting limit, the value will be reported as "~~Detectable, not quantifiable~~ Trace" by the laboratories. The achievement of reporting limits depends on sample matrix effects and the IDL. The IDL depends on instrument sensitivity. It is therefore important for the laboratories to monitor the sensitivity of data-gathering instruments to ensure data quality through constant instrument performance checks. Because the reporting limits may vary based on the IDL, the values provided in Table 5-2 are estimates and may change based on laboratory-specific circumstances.

Laboratory Quality Assurance Program
The laboratories must be NVLAP (National Voluntary Laboratory Accreditation Program) certified and must follow the NVLAP QA program requirements. In addition, the laboratories performing analyses must follow all project-specific analytical and QA/QC modifications and must continue to participate in the project-specific analysis of performance evaluation samples, inter-laboratory samples, same and different analyst recounts, verified analyses, and laboratory duplicates at the project-specified frequencies.

5.5 Special Training Requirements

Special training required for this project includes the following:

- Health and safety training, as described in the CSHASP

5.6 Documentation and Records

The HSM has the responsibility for maintenance of records, including copies of all FSDSs, original field logbooks, work plans and RASAPs, and any correspondence pertinent to conducting removal activities at the site. Original FSDSs are maintained in the on-site office in the event that sample information needs to be updated or corrected. Revisions to FSDSs will be made using a single strikeout, initial, and date. Because field logbooks are not to be revised, original logbooks are shipped offsite to a secure file repository and copies maintained for reference on-site. These are shipped by the QA representative. Property surveys, if required, are maintained in the secure file repository. Project personnel are responsible for project documents in their possession while working on a particular task. Field logbook(s) are issued on an as-needed basis. A logbook is maintained in the on-site office and provided by the HSM. Documentation describing changes to approved field plans or sample preparation or analytical methods, if they occur, will be included in the project files ~~in the form of an approved Request for Modification form. Blank field and laboratory Request for Modification forms are provided in Appendix A-3~~. Requests for ~~M~~modification ~~forms~~ will be initiated by the HSM or laboratory personnel and reviewed/approved by the OSC and PM. ~~Original forms with OSC and PM signatures will be maintained in the on-site office (for field plan changes) and at PacifiCorp (for laboratory procedure changes), with copies distributed to the file repositories.~~ The laboratories will submit hard copy sample data packages to the HSM, and electronic data deliverables (EDDs) to the PM and the HSM.

Section 6 - Measurement and Data Acquisition

This section covers sample process design, sampling methods requirements, handling and custody, analytical methods, QC, equipment maintenance, supply acceptance, and data management. The field procedures are designed so that the following occurs:

- Samples collected are consistent with project objectives
- Samples are collected in a manner so that data represent actual site conditions

6.1 Sample Process Design

The overall goal of the sampling is to monitor: (1) worker exposure and contaminant containment during removal activities; and (2) the effectiveness of the cleanup (i.e., confirmation) following removal activities. This will be accomplished by collecting personal air (BZ) samples and stationary monitoring samples during removal activities and by collecting the following samples after removal: soil confirmation and air confirmation samples for indoor dust removal. The sample process design is discussed in Section 3 of this RASAP.

6.2 Sampling Methods Requirements

Sampling methods, sample containers, and overall field management are described below.

6.2.1 Sampling Equipment and Preparation

Equipment required for field sampling, health and safety, documentation, and decontamination is presented in Sections 4.2 of the RASAP. Field preparatory activities include review of this RASAP and SOPs, procurement of field equipment, laboratory coordination, and a daily field planning meeting that includes field personnel, the HSM, and the QAM. Mobilization is described in Section 4 of the RASAP.

6.2.2 Sample Containers

All confirmation soil samples and air samples will be collected ~~and placed into plastic zip-lock baggies~~by EPA or its designee.

6.2.3 Sample Collection, Handling, and Shipment

Samples collected during the project consist of air and soil, and QC samples. All sample collection procedures are outlined in Section 4 of the RASAP, and in other SOPs as provided in Appendix A-1 to this document. ~~The SOPs applicable to this inspection are provided in Appendix A-1.~~ QC samples will also be collected, handled, and shipped in accordance with these procedures.

6.3 Sample Handling and Custody Requirements

Custody and documentation for field and laboratory work are described below, including a discussion of corrections to documentation.

6.3.1 Field Sample Custody and Documentation

Sample custody and documentation will follow the requirements specified in SOP 1-2, Sample Custody, and site-specific SOPs for completion of FSDS and electronic COC forms (Appendix A-1). All samples and sampling paperwork will be relinquished to the HSM at the end of each

day. The HSM will be responsible for managing all field forms. The distribution of field paperwork is discussed in Section 5.6. Upon completion of the FSDS by the sampler and a possible quality control spot check by an independent field team member, the HSM will use the FSDS to generate a COC. Three copies of the COC will then be printed using three-part carbonless paper. One copy will be filed in the on-site office and the other two will accompany sample shipments. The HSM will check the COC against the samples in the shipping container to ensure consistency and will hand deliver or ship samples as appropriate. If any errors are found on the COC after delivery/shipment, the paper copy of the COC maintained in the on-site office will be corrected by the HSM with a single strikeout, initial, and date. The corrected copy will then be faxed to the analytical.

6.3.1.1 Sample Labeling and Identification

A unique alphanumeric code, or Index Identification (ID), will identify each sample collected during sampling events. The coding system will provide a tracking record to allow retrieval of information about a particular sample and to ensure that each sample is uniquely identified. Index IDs will be sequential and not be representative of any particular building or equipment. Index IDs ~~will correlate with sample locations IDs, which~~ will be identified on field sample data sheets (FSDSs) and in the field logbooks. Field blanks will not be numbered. The sample labeling scheme for samples collected by R&R is as follows:

3WS-XX-###

~~2R-XXXXX~~

Where:

~~2R identifies that a sample is collected in accordance with this RASAP~~
~~XXXXX represents a 5-digit numeric code~~

3WS identifies the sample as belonging to the 3rd West Substation project
XX is the descriptor, as noted below
is a sequential number, beginning with 001, and progressing in ascending order

Code for Descriptors

P1 = North
P2 = South
P3 = East
P4 = West
P5 = Decon Clean Room
P6 = Job Trailer
P7 = NAFU Exhaust
P8 = Roof (Artistic Printing)
P9 = Decon Dirty Room
P10 = Frac Tank
P = Personal
X = Excursion
B = Bulk for LA Analysis
MB = Miscellaneous Bulk

EPA's Consultant, CDM, will use its own scheme for identifying sample it collects, such as clearance samples. It is as follows:

SLC2-#####

Where:

SLC2	identifies the sample as belonging to the 3rd West Substation project
#####	is a sequential number, beginning with 00453, and progressing in ascending order

Pre-printed adhesive Index ID labels will be prepared by the HSM or his designee using an Index ID logbook. The labels are controlled to prevent duplication in assigning sample IDs. Index ID labels will be used in accordance with SOP 1-2, Sample Custody (Appendix A-1) for contract laboratory samples. The labels will be affixed to both the sample cassette and sample bag for air samples, and both the inner and outer sample bags for soil samples collected by R&R.

6.3.1.2 Chain-of-Custody Requirements

Chain-of-custody procedures and sample shipment will follow the requirements stated in ~~the site-specific SOP for COCs and~~ SOP 1-2, Sample Custody, and SOP 2-1, Packaging and Shipping of Environmental Samples with modification (Appendix A-1). The COC record is employed as physical evidence of sample custody and control. This record system provides the means to identify, track, and monitor each individual sample from the point of collection through final data reporting. A completed COC record is required to accompany each shipment of samples. All samples will be relinquished under the authority of the HSM under strict chain of custody. The HSM or his designee will follow custody procedures to ensure proper sample custody between acceptance of samples from the samplers and shipment to the laboratory.

6.3.1.3 Sample Packaging and Shipping

Samples will be packaged and shipped in accordance with SOP 2-1, Packaging and Shipping of Environmental Samples (Appendix A-1) for samples sent to a contract laboratory. Custody seals will be placed on each sample and on at least two sides of the shipping container, if applicable. All samples will be picked up by a courier, delivered to the laboratories, or shipped by a delivery service to the designated laboratories, as necessary.

The following modifications to SOP 2-1 have been reviewed and approved for samples being analyzed for asbestos:

- Section 1.4, Required Equipment - Vermiculite (or other absorbent material), bubble wrap, or ice will not be used for packaging or shipping samples.
- Section 1.5, Procedures - No vermiculite or other absorbent material will be used to pack the samples. No ice will be used.

6.3.1.4 Field Logbook and Records

Field logbooks will be maintained in accordance with SOP 4-1, Logbook Content and Control (Appendix A-1). The log is an accounting of activities at the site and will duly note problems or deviations from the governing plans and observations relating to the sampling and analysis program. The field team leader will maintain the logbook(s) and will place copies of the field logbook in the project files on a weekly basis.

6.3.3 Corrections to and Deviations from Documentation

Documentation modification requirements for field logbook entries are described in SOP 4-1, Field Logbook Content and Control (Appendix A-1). For the logbooks, FSFS, and COCs, a single strikeout, initialed and dated, is required for documentation changes. The correct information should be entered in close proximity to the erroneous entry. All deviations from the guiding documents will be recorded in the field logbook. ~~Any major deviations will be documented via an approved Request for Modification form.~~

~~Blank Request for Modification forms documenting changes to field plans and laboratory procedures, respectively, are provided in Appendix A-3. The EPA OSC will be notified of any major changes or deviations.~~

6.4 Analytical Methods Requirements

The laboratory QA program and analytical methods are addressed below.

6.4.1 Laboratory Quality Assurance Program

Samples collected during this project will be analyzed in accordance with standard EPA and/or nationally recognized analytical procedures. The analytical laboratories must be NVLAP (National Voluntary Laboratory Accreditation Program) certified and must follow the NVLAP QA program requirements. In addition, the laboratories performing analyses must follow all project-specific analytical and QA/QC
modifications and must continue to participate in the project-specific analysis of performance evaluation samples, inter-laboratory samples, same and different analyst recounts, verified analyses, and laboratory duplicates at the project-specified frequencies.

6.4.2 Methods

The methods to be used for analysis are described in Section 5.4.2.4. The following asbestos analytical methods are to be used:

- PCM (NIOSH 7400 Issue 2), for personal breathing zone air sample analysis
- TEM AHERA (40CFR Part 763 Subpart E) with modification, for stationary and final clearance air sample analysis, and positive identification of asbestos fibers as a supplement to NIOSH 7400
- PLM (NIOSH 9002 Issue 2), for soil confirmation samples

6.5 Quality Control Requirements

Field and internal office QC are discussed below.

6.5.1 Field Quality Control Samples

Field QC samples will consist of lot and field blanks for air sampling. The frequency of collection and analysis requested for lot and field blanks are discussed in detail in Section 3.2, Quality Assurance and Quality Control Samples. No other field quality control samples are required to be collected under this RASAP.

6.5.2 Internal Quality Control Checks

Internal QC checks will be conducted throughout the project to evaluate the performance of the project team during data generation. All internal QC will be conducted in accordance with the applicable procedures listed below:

- All project deliverables will receive technical and QA reviews prior to being issued to EPA in any form.
- Completed review forms will be maintained in the project files.
- Corrective action of any deficiencies is the responsibility of the PM, with assistance from the QAM, if necessary.

6.5.3 Quality Control Checks

Internal QC checks will be conducted throughout the project to evaluate the performance of the project team during data generation. All internal QC checks will be conducted in accordance with the applicable procedures listed below:

- All project deliverables will receive technical and QA reviews prior to being issued to EPA in any form
- Completed QC Control review forms, which document technical and QA reviews of project deliverables, will be maintained in the project files.
- Field and office audits will each be performed, if requested by the PM.
- Field and office assessments may be performed as spot checks, at a frequency determined by the QAM.
- Corrective action of any deficiencies is the responsibility of the PM, with assistance from the QA staff, if necessary.

In addition to internal QC checks, PacifiCorp or EPA may, at any time, perform independent audits or assessments of work practices, including field, office, or laboratory checks.

6.6 Equipment Maintenance Procedures

All field and laboratory equipment will be maintained in accordance with the manufacturers' maintenance and operating procedures. All maintenance activities will be documented in a logbook. For the field activities, a description of maintenance performed will appear in the field logbook on the date/time that it occurred. See Section 6.7.2 for details on record keeping for maintenance at the analytical laboratories.

6.7 Instrument Calibration Procedures and Frequency

Calibration of field and laboratory instruments is addressed in the following subsections.

6.7.1 Field Instruments

The only field measurements collected during this project are volume estimations. Since these do not require field instruments, no calibration or maintenance is required.

6.7.2 Laboratory Instruments

Calibration of laboratory instruments will be based on written procedures approved by laboratory management and included in the laboratory's QA manual. Instruments and equipment will be initially calibrated and continuously calibrated at required intervals as specified by either the manufacturer or more updated requirements (e.g., methodology requirements). Calibration standards used as reference standards will be traceable to EPA, National Institute of Standards and Technology, or another nationally recognized reference standard source. Records of initial calibration, continuing calibration, repair, and/or replacement of laboratory equipment will be filed and maintained by the laboratories. Calibration records will be filed and maintained at the

laboratories' location where the work is performed and may be required to be included in data reporting packages.

6.8 Acceptance Requirements for Supplies

Prior to acceptance, all supplies and consumables will be inspected by the HSM or designee to ensure that they are in satisfactory condition and free of defects.

6.9 Non-direct Measurement Data Acquisition Requirements

Non-direct measurement data include information from previous sampling events. The acceptance criteria for such data include a review by someone other than the author. Any measurement data included in information from the above sources (i.e., previous sampling event) will determine further action at the Site only to the extent that those data can be verified by project staff.

6.10 Data Management

The laboratories will submit hard copy sample data packages to the HSM, and electronic data deliverables (EDDs) to PacifiCorp.

Section 7 - Assessment and Oversight

Assessments and oversight reports to management are necessary to ensure that procedures are followed as required and that deviations from procedures are documented. These reports also serve to keep management current on field activities. Assessment and oversight reports are discussed below.

7.1 Assessments and Response Actions

Assessments and corresponding response actions are discussed below.

7.1.1 Assessments

Performance assessments are quantitative checks on the quality of a measurement system and are appropriate to analytical work. Performance assessments for the laboratories may be accomplished by submitting reference material as blind reference (or performance evaluation) samples. These assessment samples are samples with known concentrations that are submitted to the laboratories without informing the laboratories of the known concentration. Samples will be provided to the laboratories for performance assessment upon request from the EPA OSC or PacifiCorp PM. Laboratory audits may also be conducted upon request from the EPA OSC or PacifiCorp PM.

System assessments are qualitative reviews of different aspects of project work to check on the use of appropriate QC measures and the functioning of the QA system. Any determination or changes for project assessments will be performed under the direction of the QA manager, who reports directly to the PM.

7.1.2 Response Actions

Response actions will be implemented on a case-by-case basis to correct quality problems. Minor response actions taken in the field to immediately correct a quality problem will be documented in the applicable field logbook and a verbal report will be provided to the HSM. For verbal reports, the HSM will complete a communication log to document that response actions were relayed to him. Major response actions taken in the field will be approved by the HSM and the EPA OSC and PacifiCorp PM prior to implementation of the change. Major response actions are those that may affect the quality or objective of the project. All formal response actions will be submitted to either the HSM or the QAM for review and issuance.

7.2 Reports to Management

QA reports will be provided to the HSM and PM whenever quality problems are encountered. Quality problems will be noted on field data sheets. The HSM will inform the project QAM upon encountering quality issues that cannot be immediately corrected. Weekly reports and change request forms are not required for this work assignment. Monthly QA reports will be submitted to the PM by the project QAM.

Topics to be summarized regularly may include but not be limited to:

- Document technical and QA reviews that have been conducted
- Activities and general program status
- Project meetings
- Corrective action activities
- Any unresolved problem
- Any significant QA/QC problems not included above

Section 8 - Data Validation and Usability

Laboratory results will be reviewed for compliance with project objectives. Data validation and evaluation are discussed in Sections 8.1 and 8.2, respectively..

8.1 Data Review, Validation, and Verification

Requirements:

The HSM or QAM may validate data submitted by analytical laboratories. Data validation will be performed according to the EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 2002), with method specific requirements superseding the NFG guidelines. If validation is requested, an SOP for the method-specific validation process will be prepared. In general, data validation consists of examining the sample data package(s) against pre-determined standardized requirements. The validator may examine, as appropriate, the reported results, QC summaries, case narratives, COC information, raw data, LCS/LCSDs, MS/MSDs, initial and continuing instrument calibration, and other reported information to determine the accuracy and completeness of the data package. During this process, the validator may verify that the analytical methodologies were followed and QC requirements were met. The validator may recalculate selected analytical results to verify the accuracy of the reported information. Analytical results will then be qualified as necessary. Data verification includes checking that results have been transferred correctly from laboratory data printouts to the laboratory report and to the EDD.

8.2 Reconciliation with Data Quality Objectives

Once data has been generated, the HSM evaluates data to determine if DQOs were achieved. This achievement will be discussed in the measurement report, including the data and any deviations to this RASAP. Additionally, a section in the measurement report will present the data quality assessment (DQA) evaluation. The DQA will synthesize the data reviews described in Section 8.1 and provide information about any overall biases introduced into the data due to either field or analytical activities. All QC sample results will be maintained in the same database along with the investigative sample results.

Section 9 - References

RAC Region VIII Quality Management Plan. January,2003b.

Modification to Laboratory Activities. June. 2002a.

Final Sampling and Analysis Plan for the Remedial Inspection of Contaminant Screening Study. April. 2002b.

Technical Standard Operating Procedures Manual. Revision 16. December. 2002c.

Quality Assurance Manual, Revision 10. February. 2002d.

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, Final. July2001.

EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Final2000.

Guidance for the Data Quality Objectives Process, EPA QA/G-4, Final. September1994.

Test Methods for Evaluating Solid Waste, Laboratory Manual. 3rd Edition. September with revisions

Appendix A-1: SOPs

Sample Custody (SOP 1-2)

Part I: Bulk samples:

Equipment needed:

- Sample Containers (Plastic Bottles, etc.)
- Garden Spade
- Zip-lock-type plastic bags
- Marking Pen
- Ball-Point-type pen
- FSDS, COC forms
- Field Notebook
- Clipboard

Procedure:

- Determine sample location(s) IAW Health and Safety Plan, daily needs
- Use cleaned tools to obtain the sample
- Place sample in a plastic sample container
- Immediately after each bulk sample is obtained, label sample container with a unique number
- Put sample container in a plastic storage/transmittal bag
- Complete Field Sample Data Sheet (FSDS), fill in appropriately as each sample is obtained
- Fill out Chain of Custody (COC) Form, if separate from FSDS
- Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples

Part II: Air Samples:

Site Sampling:

Equipment needed:

- TEM cassettes (MCE)
- Medium/High Flow AC Pumps (capable of drawing approximately 16 liters/minute)
- Tygon-type tubing
- Duct tape
- Zip-lock-type plastic bags
- Marking Pen
- Ball-Point-type pen
- FSDS, COC forms
- Field Notebook
- Clipboard
- Extension cord(s)

Procedure:

Determine sample location(s) IAW Health and Safety Plan, daily needs
Position pump(s), ensure electricity is available (run extension cord, as necessary)
Turn pump on; allow pump to warm up for at least five minutes before beginning sample
Assign unique number to sample, write on label affixed to TEM cassette
Record location, TEM cassette number on FSDS
Attach Tygon-type tubing on pump
Affix end of tubing securely at approximately "breathing zone" height (approx. 60 inches)
Remove plugs from TEM cassette
Attach TEM cassette to tubing (with cap attached)
Perform calibration with precision rotometer; record flow on FSDS
Remove cassette cap (sample open faced)
Note time, record on FSDS and cassette label
If sample duration exceeds 4 hours, check sample at mid-point*
After appropriate sampling interval, perform calibration, record on FSDS
Record time on FSDS and remove cassette
Replace plugs on cassette
Seal cassette and place cassette in plastic bag
Determine and record average flow on FSDS and sample label
Turn off pump or add new cassette, as needed
Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples

Personal Sampling:

Equipment needed:

PCM cassettes (MCE)
Low-Flow Battery-Operated Pumps (with charger)
Tygon-type tubing
Duct tape
Zip-lock-type plastic bags
Marking Pen
Ball-Point-type pen
FSDS, COC forms
Field Notebook
Clipboard

Procedure:

Turn pump on
Attach Tygon-type tubing
Assign unique number to sample, record on label affixed to PCM cassette
Record PCM cassette number on FSDS
Remove plugs from PCM cassette
Attach PCM cassette to tubing (with cap attached)

Attach PCM cassette to tubing
Calibrate sample train with precision rotometer
Remove cassette cap (sample open faced)
Record sample number, location, flow on FSDS and on sample label
If sample duration exceeds 4 hours, check sample at mid-point*
After appropriate sampling interval, calibrate sample train
Remove cassette, replace plugs
Record appropriate data on cassette label
Seal cassette and place in plastic storage/transfer bag
Fill out FSDS
Turn off pump or add new cassette, as needed
Package samples for transport IAW SOP 2-1, Packaging and Shipping of Environmental Samples

All samples will be kept in a locked area or the sampler's immediate possession at all times until delivered to lab
If samples are transferred to another authorized person for transmittal, the transporter must sign for the samples on Chain Of Custody Form (may be part of FSDS)
The lab will sign for the samples upon receipt
* If sample membrane shows darkening, change out cassette with new

Surface Soil Sampling (SOP 1-3)

Composite samples shall be taken each 625 square feet of area to determine if LA content is below clearance criteria:

1. Excavation will continue until the excavated area is free of all visible LA
2. Collect five soil samples (each approximately two cubic inches) randomly from the exposed substrate
3. Composite the five samples into one sample container
4. Each composite sample will be split (one portion held in archive, one submitted to the lab and one given to EPA at their request)
5. Submit one "split" composite sample to lab
6. Each submitted composite sample will be homogenized at the lab
7. Sample collection equipment used on-site will be washed between each composite sampling episode

Packaging and Shipping of Environmental Samples (SOP 2-1)

Environmental Samples will be:

1. Packaged in plastic containers, which will be placed in plastic Zip-Lock-type bags
2. Cushioned to prevent potential damage during shipment (samples will not be packaged using vermiculite or other absorbant material, ice nor bubble wrap)
3. Subjected to Chain-Of-Custody requirements until shipped and at each transfer
4. Transported to the appropriate lab or drop-off point (FedEx, etc.) as soon as practicable